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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

PHAM, TAMMY T

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/662,518	Applicant(s) YAMAGUCHI ET AL.	
	Examiner Tammy Pham	Art Unit 2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Applicant's argument, see 4 December 2007, with respect to claims 16-18 have been fully considered and are persuasive. The Final Rejection of 4 October 2007 has been withdrawn. In particular, Applicant's argument that "*the October 4, 2007 Office Action did not address added claims 16-18 (submitted August 13, 2007) (Remarks 1),*" are persuasive.
2. Claims 1-18 are considered below.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over JACOBSON et al. (US Patent No: 5,961,804).
5. **As for independent claim 1 and claim 12**, JACOBSON teaches of a monochromatic image display system comprising a flat panel-like display device (not shown), each picture element (Fig. 3a, item 320) of the display device (not shown) emitting light in a same color (Fig. 3a, item 330).
6. JACOBSON fails to teach that each that the same color falls within the region surrounded by points (0.174, 0), (0.28, 0.32) and (α , 0.32) as represented by co-ordinates (x, y) on a CIE

chromaticity diagram, wherein α represents the x-coordinate of the intersection of a spectrum locus and a straight line $y=0.32$.

7. Examiner takes official notice that it is well known in the art to specify that the same color is blue, or specifically that the same color falls within the region surrounded by points (0.174, 0), (0.28, 0.32) and (α , 0.32) as represented by co-ordinates (x, y) on a CIE chromaticity diagram, wherein α represents the x-coordinate of the intersection of a spectrum locus and a straight line $y=0.32$, evidence of which may be found in Edwards et al. (US Patent No: 4,851,900) and Uehara et al. (US Patent No: 4,140,940) as explained below.

8. It would have been obvious to one with ordinary skill in the art at the time the invention was made to have the display device emit light in a same color as taught by JACOBSON and specify that the "same color" is blue because it is a well known common practice within the medical community to produce images in shades of blue (see reference cited in Conclusion).

9. Claims 2-15, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over JACOBSON et al. (US Patent No: 5,961,804) in view of GORDON, II et al. (US Patent No: 6,271,823 B1).

10. As for claims 2, 17, JACOBSON fails to teach that the display device is provided with at least one element selected from the group consisting of a substrate, a face plate, a diffuser panel, a color filter, a diffuser film, a collimator film, a prism film or ~~and~~ a polarizing film which are colored to a predetermined color.

11. GORDON teaches of a color filter in column 6, lines 19-26.

12. It would have been obvious to one with ordinary skill in the art at the time the invention was made to include the color filter as taught by GORDON with the display device of JACOBSON in order to effectively reflect the color of the cell (see GORDON: column 6, lines 19-20).

13. As for claim 3, JACOBSON as modified by GORDON {in claim 2 above} fails to teach that at least one element comprises polyethylene terephthalate colored with anthraquinone dye having the predetermined color, but does disclose the use of an unspecified “dyed carrier fluid (Jacobson: column 8, lines 50-56).”

14. Applicant has not disclosed any specific advantage or criticality to having polyethylene terephthalate colored with anthraquinone dye. As such, the anthraquinone dye is an obvious matter of design choice.

15. It would have been obvious to use any type of dye, including polyethylene terephthalate colored with anthraquinone dye, since any dye would work effectively to color the region.

16. As for claim 4, JACOBSON teaches of a monochromatic image display device that each cell is expressed in the same color in Fig. 3a-b and in column 8, lines 49-60.

17. JACOBSON fails to teach that each picture element of the display device comprises a series of spatially adjacent cells, each cell configured to express tones in three-or-more levels of the same color, and that the image display system further comprising at least one of: an area modulation means which controls an output luminance of each picture element by selectively turning on and off input signals to the respective cells, for the picture element, independently of

each other, a time modulation means which drives the respective cells for each picture element in a time division system, and an intensity modulation means which controls input signal levels to the respective cells for each picture element independently of each other, wherein the cells are driven so that a maximum luminance of each picture element is in a range of 100cd/m² to 10000cd/m².

18. GORDON teaches that each picture element (Fig. 1, item 26) of the display device (Fig. 1) comprises a series of spatially adjacent cells (Fig. 1, items 14, 16, 18), each cell (Fig. 1, item 14, 16, 18) configured to express various levels in column 4 lines 15-20. (NOTE: Where the amount of color, or the tone, is dependent upon application of varying voltage levels).

GORDON further teaches that the image display system (not shown) further comprising at least one of: an area modulation means (not shown) which controls an output luminance of each picture element by selectively turning on and off input signals to the respective cells (Fig. 1, item 14, 16, 18), for the picture element (Fig. 1, item 26), independently of each other in column 4, lines 19-20. (NOTE: Where the on and off states refers to the distributed and collected states).

GORDON further teaches of a time modulation means which drives the respective cells for each picture element in a time division system in column 4, lines 14-20. (NOTE: That Applicant defines the time modulation system in section [0167] to be:

...the time modulation means 220 divides a unit time into four time segments and carries out a time division drive in which the input signal is selectively turned on and off by the time segment. Then an output signal of the time modulation means 220 is input into the area modulation means 230 corresponding to each cell...

19. according to this broad definition, GORDON indirectly teachings of a time modulation means since an appropriate voltage, the input signal, is inputted into each cell from time to time).

GORDON further teaches of an intensity modulation means which controls input signal levels to the respective cells (Fig. 1, item 14, 16, 18) for each picture element (Fig. 1, item 26) independently of each other, wherein the cells (Fig. 1, item 14, 16, 18) are driven in column 4, lines 15-20. (NOTE: That although neither JACOBSON nor GORDON specifies that the maximum luminance range is of 100cd/m² to 10000cd/m²; this is a consequence of specifying that the “same color” is blue as explained in claim 1. In other words, in picking the color blue, it is generally presumed that the range is within 100-10000cd/m². For evidentiary reference, please refer to HU et al., US Patent No: 5,932,363; column 13, lines 65-5).

20. It would have been obvious to one with ordinary skill in the art at the time the invention was made to include the area, time and intensity modulation means as taught by GORDON with the same color display of JACOBSON in order to provide a low-powered yet large color gamut display (see GORDON: column 2, lines 64-66).

21. GORDON fails to teach that each cell is expressed in three or more tones.

22. Examiner takes official notice that it is well known to specify that each cell in three or more tones, evidence of which may be found in Edwards et al. (US Patent No: 4,851,900) and Uehara et al. (US Patent No: 4,140,940) as explained below.

23. It would have been obvious to one with ordinary skill in the art at the time the invention was made to have each cell be in three or more tones in order to provide a quality image to the user by have multi-tones.

24. **As for claim 5**, see the rejection of claim 4 above.

25. As for claim 6, JACOBSON teaches that the flat panel-like display device is a liquid crystal panel in column 9, lines 6-9.

26. As for claim 7, JACOBSON fails to teach that the flat panel-like display device is an organic EL panel.

27. Examiner takes official notice that it is well known to use the technology as applied in JACOBSON in an OLED display.

28. It would have been obvious to one with ordinary skill in the art at the time the invention was made to implement the same color display of JACOBSON in an OLED display because OLEDs displays are energy efficient. Further, even Applicant admits that the same technology may be used in either or LCD or OLED panel (see Specifications: sections [0065, 0164]).

29. As for claim 8, see the rejection of claim 4 above.

30. As for claims 9, 13, JACOBSON as modified by GORDON {as in claim 4 above} teaches that an average {claim 9} and the sum {claim 13} of the output luminance of all the cells (GORDON: Fig. 1, item 14, 16, 18) within each respective picture element (GORDON: Fig. 1, item 26) correspond to an output luminance of the respective picture element (GORDON: Fig. 1, item 26) in column 4, lines 5-10. (NOTE: Since each pixel is made up of two or more sub-pixels; it would make sense that the average and sum of each sub-pixels is representative of the average and sum of the overall pixel or picture element).

31. As for claims 10, 14, JACOBSON as modified by GORDON {as in claim 4 above} teaches that a cell signal generating means (not shown) for generating, based on a monochromatic image signal indicating an output luminance of each picture element (GORDON: Fig. 1, item 26) of the monochromatic image, a cell signal for each spatially adjacent cell (GORDON: Fig. 1, item 14, 16, 18) of a respective picture element (GORDON: Fig. 1, item 26) of the display device, wherein each respective picture element of the display device (not shown) corresponds to a picture element (GORDON: Fig. 1, item 26) of the monochromatic image in GORDON: column 4, lines 15-20 and in JACOBSON: column 8, lines 49-55.

32. As for claims 11, 15, JACOBSON as modified by GORDON {as in claim 4 above} teaches that a tone number conversion means (not shown) for carrying out a tone number conversion processing on an input original monochromatic image signal, thereby generating the monochromatic image signal indicating the output luminance of each picture element (Fig. 1, item 26) of the monochromatic image, wherein a number of tones represented by the monochromatic image signal is no greater than a number of tones which can be expressed by each respective picture element (Fig. 1, item 26) of the display device, and wherein a number of tones represented by the input original monochromatic image signal is greater than the number of tones represented by the monochromatic image signal in GORDON: column 4, lines 15-20 and in JACOBSON: column 8, lines 49-55.

33. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over JACOBSON et al. (US Patent No: 5,961,804) and Ota (US Patent No: 3,792,308).

34. **As for claim 16**, Jacobson fails to teach that the display system comprises of a light source.

35. Ota teaches that the display system comprises of a light source (Fig. 1a, items 50a-b).

36. It would have been obvious to one with ordinary skill in the art at the time the invention was made to include the light sources as taught by Ota with the display of Jacobson in order to apply radiation flux to brighten the display (Ota, column 3, lines 5-10).

37. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over JACOBSON et al. (US Patent No: 5,961,804) in view of GORDON, II et al. (US Patent No: 6,271,823 B1) and Jacobson et al. (US Patent No: 6,721,083 B2).

38. **As for claim 18**, Jacobson ('804) as modified by GORDON fails to teach that the levels expressed per cell ranges from 3 to 236.

39. Jacobson ('083) teaches that the levels expressed per cell ranges from 3 to 236 (column 43, lines 20-25).

40. It would have been obvious to one with ordinary skill in the art at the time the invention was made to have each cell be expressed in three or more levels as taught by Jacobson ('083) with the display of Jacobson ('804) as modified by GORDON in order to provide a display with more shades or color (Jacobson ('083), column 43, lines 20-25).

Response to Arguments

41. Applicant's arguments filed 13 August 2007 have been fully considered but they are not persuasive.

42. **In regards to claims 2-3**, Applicant argues that the 112 rejection is improper because there is support for "*at least one*" list in Fig. 24 and in text pages 55-56 (Remarks 6). This is persuasive and the rejection has been withdrawn.

43. **In regards to claims 4-5**, Applicant argues that the 112 rejection is improper because "*[t]he specification indicates that a several different levels are possible that would inform one skilled in the art of the number of tones expressed by the cells (Remarks 7).*" This is persuasive and the rejection has been withdrawn.

44. **In regards to claim 1**, Applicant argues that "*Jacobson makes clear that the electrophetic display is non-emission in column 1, lines 14-15 (Remarks 8).*" This is not persuasive. The claim language remains broad and calls for a "*display device emitting light (claim 1, line 2).*" Jacobson teaches that the display device emits light (column 2, lines 66-1); and hence reads upon the claim language as currently claimed.

45. **In regards to claim 1**, Applicant further argues that Jacobson teaches that "*each pixel element necessarily has a display of two colors, one for the suspended particle and one for the suspension fluid (Remarks 8-9).*" This is not persuasive. The claim language is broad is does not specify that both the suspended particle and suspension fluid must be the same color. The claim language limits to a "*display device emitting light in a same color (claim 1, line 2).*" Jacobson teaches of a display device emitting light in a same color in column 1, lines 30-35; and hence reads upon the broad claim language as currently stated.

46. **In regards to claim 1**, Applicant further argues that “*the display cannot be monochromatic or display the same color (Remarks 9).*” This is not persuasive. Jacobson teaches that “the display device emitting light in a same color (claim 1, line 2) (see column 3, lines 40-45; column 8, lines 49-60, column 2, lines 53-55).”

47. **In regards to claim 1**, Applicant further challenges the official notice used that is is well known to have a display in blue that is within the region surrounded by points (0.174, 0), (0.28, 0.32) and $(\alpha, 0.32)$ as represented by co-ordinates (x, y) on a CIE chromaticity diagram, wherein α represents the x-coordinate of the intersection of a spectrum locus and a straight line $y=0.32$ (Remarks 9). For evidentiary references, please refer to Edwards et al. (US Patent No: 4,851,900) which teaches that it is common to one with ordinary skill in the art to use a blue display because the color prove for “best examination (column 1, lines 64-68).” Further, please refer to Uehara et al. (US Patent No: 4,140,940) which teaches that it is well known to one with ordinary skill in the art that blue falls with the region surrounded by points (0.174, 0), (0.28, 0.32) and $(\alpha, 0.32)$ as represented by co-ordinates (x, y) on a CIE chromaticity diagram, wherein α represents the x-coordinate of the intersection of a spectrum locus and a straight line $y=0.32$ (see Fig. 1).

48. **In regards to claim 4**, Applicant argues that “*neither Jacobson nor Gordon teaches the three or more levels...the devices of Jacobson and Gordon cannot be modified to operate at three or more levels (Remarks 9).*” This is not persuasive. Even assuming that Jacobson and Gordon is only limited to two states of output (collected and distributed state) (Remarks 9); this does not prohibit Jacobson nor Gordon to display “*tones in three or more levels (claim 4, line 3).*” Gordon teaches the possibility of increasing the number of tones to three or more levels, by

teaching that the color is dependent upon the position of pigment particles in which cell. This in turn, depends upon the application of voltages to the electrodes. Hence, Jacobson as modified by Gordon may be modified to operate at three or more levels; since Gordon teaches of the possibility of varying the colors by varying the voltage being applied to the cells. For further evidentiary references, please refer to Lee et al. (US Patent No: 6,384,847 B1; column 1, lines 20-25).

49. **In regards to claim 4**, Applicant further argues that because Gordon teaches that *"the cells must assume one of the distributed or collected state depending on the state of another cell and depending on the color to be displayed... the cells are not independent as the Examiner contends (Remarks 9)."* This argument is not persuasive. First of all, the claim language broadly recites of *"an intensity modulation means which controls input signals levels to the respective cells for each picture element independently of each other (lines 11-12)."* In other words, even if Gordon teaches as claimed above, the claim language does not forbid that the state of each cell must be independent upon each other. Second, the claim language as currently stated merely teaches that the control input signals are independently inputted to each cell. Hence, Gordon reads upon this claim limitation by teaching that the electrodes in each cell are individually addressable (Gordon, column 6, lines 57-61). Due to the broad claim language, Gordon still reads upon the claim limitations.

50. **In regards to claim 4**, Applicant further argues that the combination of Hu with Gordon and Jacobson is not permissive because Hu relates to a light emissive display while Gordon and Jacobson relates to a non-emissive display (Remarks 10). This is not persuasive. Jacobson teaches of a display that displays one color. Jacobson as modified above in claim 1, teaches of

the well known benefits of having a display that displays only in a blue shade. What Jacobson and Gordan lacks is that the luminance is within a particular range. Hu was brought in to show that it is well known in the art that blue falls within this range. In other words, given the display system that display blue (as taught by Jacobson and Gordan), it was well known in the art that the luminance of the display would fall between the given luminance range; since blue generally falls within the stated range. Because Hu was brought in to show that it is well known in the art that blue falls within a given luminance range, Applicant's arguments is not persuasive because it is Hu is simply brought in to show that the range of blue is well known.

51. **In regards to claim 7**, Applicant argues that “[t]he substitution of the OEL (emissive) display of claim 7 would completely undermine the operations of the (nonemissive) displays of the Jacobson and Gordon references (Remarks 10).” This is not persuasive. It is well known in the art that most inventive art can be applied to both OLED and electro-phoretic displays interchangeably (see Matsumoto et al (US Patent No: 6,844,957 B2) and similar patents for evidentiary support). Further, Applicant does not limit the technology to one type of display. Applicant also teaches that the technology is used in both emissive and non-emissive displays (see claims 6-7).

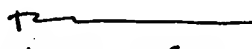
Conclusion

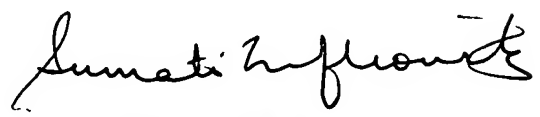
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tammy Pham whose telephone number is (571) 272-7773. The examiner can normally be reached on 8:00-5:30 (Mon-Fri).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TP
7 January 2008


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